Name (Last, First) _____ **ID #** _____

Signature _____

Professor _____ **Section #** _____

UNIVERSITY OF MASSACHUSETTS AMHERST
DEPARTMENT OF MATHEMATICS AND STATISTICS

Math 131 **Symbolics Exam** **11/4/04, 6:30–7:30 p.m.**

- In each of the ten (10) questions, calculate the indicated derivative.
- Do ***not*** "simplify" your answers.
- Use enough parentheses to show clearly how expressions are grouped together. For example, do *not* write $x + 2 \cdot x - 1$ if you really mean $(x + 2)\,(x - 1)$.
- Letters a, b, and k stand for constants.
- Do ***not*** use a calculator; do ***not*** use any "cheat sheet" or other paper.
- Be ready to show your UMass ID card when you hand in your exam booklet.

1. $\dfrac{d}{d\,x}\left(4\,x^{11} - x^2 + 131\,x - 2004\right) =$

2. $\dfrac{d}{d\,x}\left(\cos 4\,x + \sin^4 x\right) =$

3. $\dfrac{d}{d\,x}\left(x^4\,e^{-x}\right) =$

4. $\dfrac{d}{d\,t}\,\dfrac{1}{\sqrt[4]{16 - t^2}} =$

5. $\dfrac{d}{d\,u}\left(\dfrac{e^{4\,u}-a}{e^{-\,4\,u}+b}\right)=$

6. $\dfrac{d}{d\,\theta}\,\ln(\sin k\,\theta)=$

7. $\dfrac{d}{d\,t}\left[(t^2+4\,e^t)\,\left(1-\dfrac{1}{t^2}\right)\right]=$

8. $\dfrac{d}{d\,x}\left(4^{131}+x^{131}-131^x\right)=$

9. $\dfrac{d}{d\,x}\left(\sec 4\,x+4\arctan x^2\right)=$

10. If $x^4+y^4-x\,y^2=4$, then $\dfrac{d\,y}{d\,x}=$